

In vivo Antidiabetic and Antioxidant Potential of Pseudovaria macrophylla Extract

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Abstract : This study has investigated the antidiabetic and antioxidant potential of Pseudovaria macrophylla bark extract on streptozotocin-nicotinamide induced type 2 diabetic rats. LCMS-QTOF and NMR experiments were done to determine the chemical composition in the methanolic bark extract. For in vivo experiments, the STZ (60 mg/kg/b.w, 15 min after 120 mg/kg/1 nicotinamide, i.p.) induced diabetic rats were treated with methanolic extract of Pseudovaria macrophylla (200 and 400 mg/kg•bw) and glibenclamide (2.5 mg/kg) as positive control respectively. Biochemical parameters were assayed in the blood samples of all groups of rats. The pro-inflammatory cytokines, antioxidant status and plasma transforming growth factor beta-1 (TGF-β1) were evaluated. The histological study of the pancreas was examined and its expression level of insulin was observed by immunohistochemistry. In addition, the expression of glucose transporters (GLUT 1, 2 and 4) were assessed in pancreas tissue by western blot analysis. The outcomes of the study displayed that the bark methanol extract of Pseudovaria macrophylla has potentially normalized the elevated blood glucose levels and improved serum insulin and C-peptide levels with significant increase in the antioxidant enzyme, reduced glutathione (GSH) and decrease in the level of lipid peroxidation (LPO). Additionally, the extract has markedly decreased the levels of serum pro-inflammatory cytokines and transforming growth factor beta-1 (TGF-β1). Histopathology analysis demonstrated that Pseudovaria macrophylla has the potential to protect the pancreas of diabetic rats against peroxidation damage by downregulating oxidative stress and elevated hyperglycaemia. Furthermore, the expression of insulin protein, GLUT-1, GLUT-2 and GLUT-4 in pancreatic cells was enhanced. The findings of this study support the anti-diabetic claims of Pseudovaria macrophylla bark.

Keywords : diabetes mellitus, Pseudovaria macrophylla, alkaloids, caffeic acid

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